Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Due in class – Tues September 4th

Refer to chapter 2 & the Chemistry PowerPoint while answering the questions. below.

**Basic Chemistry cont.**

1. Beryllium's mass number is 9, and its atomic number is 4. How many neutrons are found in a beryllium atom?
   1. 9
   2. 13
   3. 4
   4. 5
2. In the following reaction, what type of bond is holding the two atoms together?

K+Cl → K+ + Cl− → KCl

1. hydrophilic
2. ionic
3. hydrophobic
4. covalent
5. What name is given to bonds that involve the **sharing** of electrons?
   1. A) covalent
   2. B) hydrogen
   3. C) ionic
   4. D) polar
6. As water freezes, \_\_\_\_\_\_\_\_.
7. its molecules move farther apart
8. it cools the surrounding environment
9. its hydrogen bonds break apart
10. it loses its polarity

**Organic Chemistry**

1. Joining monomers to make polymers involves this type of reaction: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Glycogen, starch, and cellulose are all
   1. monosaccharides
   2. disaccharides
   3. polysaccharides
   4. simple sugars
3. The most important function of a nucleic acid is
   1. Catalyzing chemical reactions
   2. Forming a barrier between the inside and outside of the cell
   3. Storing energy
   4. Storing information related to heredity and protein synthesis
4. What is the difference between a nucleotide and nucleic acid?
5. Complete the table that describes the four classes of large biological molecules.

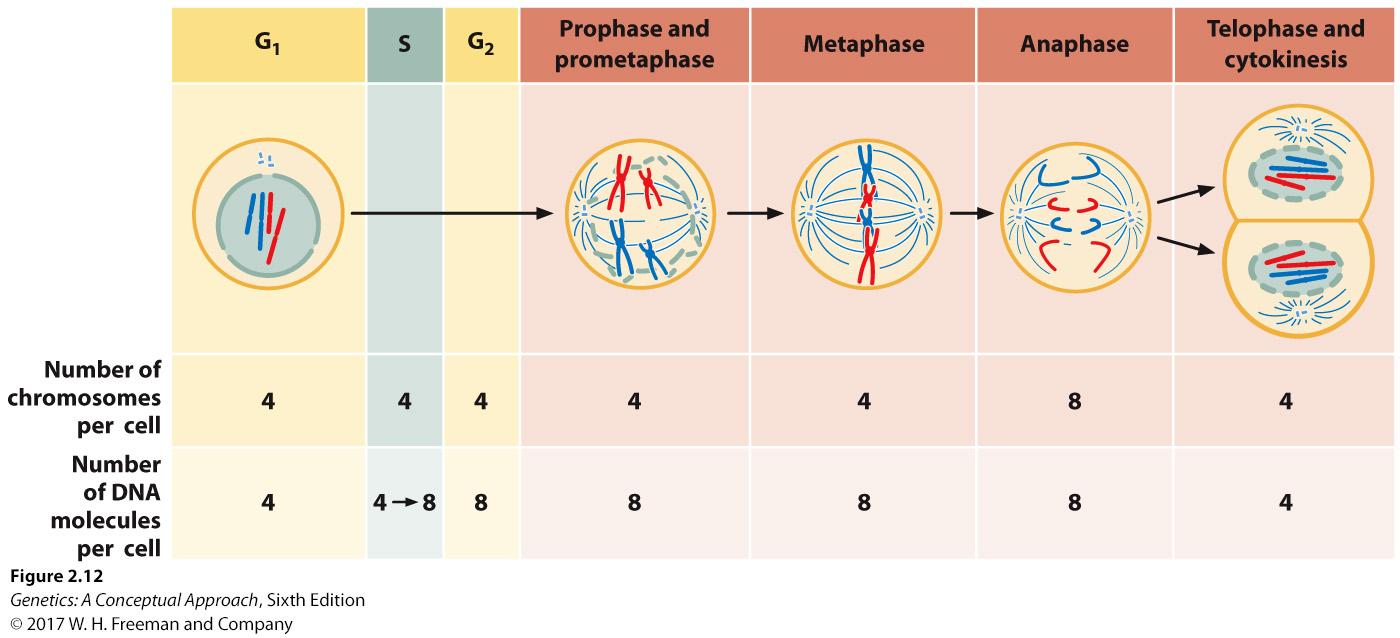
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Carbohydrates | Proteins | Lipids | Nucleic acids |
| **Monomers** |  |  |  |  |
| **Polymers** |  |  |  |  |
| **Major Function(s)** |  |  |  |  |

1. DNA contains            polynucleotide strands, each composed of            kinds of nucleotides. (Provide two numbers).
2. If one DNA strand has the sequence GAATGC, what is the sequence of the other strand?

**Cell Cycle and Mitosis**

1. The three domains of life described by biologists today are Bacteria, Archaea, and Eukarya. What is the principal difference between eukaryotes (domain Eukarya) and prokaryotes (domains Archaea and Bacteria)?
   1. Prokaryotes do not have a plasma membrane surrounding the cell.
   2. Prokaryotes use RNA and not DNA to pass on the genetic message.
   3. In eukaryotes, the interior of the cell is divided by internal membranes into specialized compartments.
   4. Eukaryotes engage in cellular metabolism, whereas prokaryotes do not.
2. A chromosome consists of two **sister chromatids**. Does the genetic information on the two sister chromatids come from only one parent or from both parents? Explain your reasoning. Think about when you have sister chromatids, before or after DNA replication (the S part of interphase).
3. . A cell that has acquired damage to some of its DNA will be stalled at \_\_\_\_\_\_\_ of the cell cycle.
   1. G1
   2. S
   3. G2
   4. a checkpoint
4. Most body (nonreproductive) cells of humans and other multicellular eukaryotes have two sets of each chromosome. Such cells are \_\_\_\_\_\_ and the matching pairs of chromosomes are called \_\_\_\_\_\_\_\_\_.
5. diploid; homologous chromosomes
6. haploid; homologous chromosomes
7. diploid; sister chromatids
8. tetraploid; sister chromatids
9. Sister chromatids separate and move toward opposite poles during which phase of mitosis?

1. prophase
2. prometaphase
3. metaphase
4. anaphase
5. telophase
6. In the example below, how many chromosomes are in each cell in prophase and anaphase?



* 1. 8 and 8
  2. 4 and 4
  3. 4 and 8
  4. 8 and 4
  5. 2 and 8

1. All of the following make meiosis different from mitosis EXCEPT
2. meiosis comprises two divisions.
3. chromosome number is reduced by half in meiosis.
4. resulting cells from meiosis are genetically different from the parent cell.
5. meiosis lacks a preceding S phase.
6. pairing of homologous chromosomes usually only occurs in meiosis.
7. A eukaryotic chromosome that lacked telomeres would also lack
8. kinetochore proteins.
9. sister chromatids.
10. a centromere.
11. protection of the chromosome ends.
12. genes.
13. Which is the correct order of stages in the cell cycle?
    1. G1, S, prophase, metaphase, anaphase
    2. S, G1, prophase, metaphase, anaphase
    3. Prophase, S, G1, metaphase, anaphase
    4. S, G1, anaphase, prophase, metaphase